CLAIMS

1. In an optical system for viewing an object and having an objective aperture through which light passes, the improvement comprising:

means continuously changing the portion of the objective aperture through which light passes.

2. The improvement of claim 1 wherein the optical system is further described as having a viewing path and the objective aperture is in the viewing path.

3. The improvement of claim 1 wherein the optical system is further described as having an illumination path and the objective aperture is in the illumination path.

4. The improvement of claim 3 wherein the illumination path is further described as including a light source and the objective aperture is between the light source and the object.

5. The improvement of claim 2 wherein the viewing path is further described as including an eye point and the objective aperture is between the eye point and the object.

6. The improvement of claim 2 wherein the viewing path is further described as including an eye point and the objective aperture is at the eye point.

7. In an optical system for viewing an object and having an objective aperture through which light passes, the improvement comprising:

a dynamic aperture mask disposed at the objective aperture.

8. The improvement of claim 7 wherein said dynamic aperture mask is an array of LCDs.

9. The improvement of claim 7 wherein said dynamic aperture mask is an expandable bellows.

10. The improvement of claim 7 wherein said dynamic aperture mask is overlapping leaflets.

11. The improvement of claim 7 wherein said dynamic aperture mask is two overlapping semi-circular opaque discs.

12. The improvement of claim 7 wherein said dynamic aperture mask is a plurality of sector-shaped LCDs.

13. The improvement of claim 7 wherein said dynamic aperture mask has a variable size aperture.

14. The improvement of claim 13 wherein said variable size aperture is sector shaped.

15. The improvement of claim 13 wherein the objective is further described as having an axis and said variable size aperture is an iris diaphragm disposed off the objective axis.

16. The improvement of claim 7 wherein the aperture in said dynamic aperture mask has the shape of a sector of a phase annulus.

17. In an optical system for viewing an object and having an objective aperture through which light passes, the improvement comprising:

a carrier disposed at the objective aperture and moveable relative thereto;

a plurality of dynamic aperture masks on said carrier each of which can be aligned with the objective aperture by moving said carrier relative thereto.

18. The improvement of claim 17 wherein the apertures of said dynamic aperture masks are sectors of different sizes.

19. The improvement of claim 17 wherein the apertures of said dynamic aperture masks are sectors of phase annuli of different sizes.

20. In an optical system having an objective aperture for viewing an object the improvement comprising:

a shaped light beam continuously passing through a different portion of the objective aperture.

21. The improvement of claim 13 wherein said shaped light beam is from an array of LEDs.

22. In a method for creating a 3-D view of an object in an imaging system having an objective aperture through which light passes, the steps comprising:

causing the light to pass through only a portion of the objective aperture; and

continuously changing the portion of the objective aperture through which light passes.

23. The method of claim 22 wherein a dynamic aperture mask is used to cause the light to pass through only a portion of the objective aperture.

24. The method of claim 22 wherein an array of LCDs is used to cause the light to pass through only a portion of the objective aperture.

25. The method of claim 22 wherein an array of LEDs is used to cause the light to pass through only a portion of the objective aperture.

26. The method of claim 22 wherein a shaped beam is used to cause the light to pass through only a portion of the objective aperture.

27. The method of claim 22 wherein ~~the imaging system~~ is a light microscope having an illumination path including at least one objective aperture and a

viewing path having at least one objective aperture wherein the objective aperture through which light passes through only a portion is in the illumination path.

28. The method of claim 22 wherein the imaging system is a light microscope having an illumination path including at least one objective aperture and a viewing path having at least one objective aperture wherein the objective aperture through which light passes through only a portion is in the viewing path.

29. The method of claim 22 wherein the imaging system is a light microscope having a light source wherein the objective aperture through which light passes through only a portion is in the light source.

30. The method of claim 22 wherein the imaging system is a light microscope having a photo tube and the objective aperture through which light passes through only a portion is at the photo tube.

31. The method of claim 22 wherein the imaging system is a light microscope having an eye piece and the objective aperture through which light passes through only a portion is at the eye piece.

32. The method os claim 22 wherein the microscope is a phase contrast microscope.

33. The method of claim 29 wherein the microscope is a phase contrast microscope.

34. In a phase contrast microscope having a light source with an objective aperture through which light is directed the improvement comprising:

means continuously changing the portion of the objective aperture through which light passes.

35. In the phase contrast microscope of claim 34 where the means is a dynamic aperture mask.

36. In the phase contrast microscope of claim 34 where the means is a dynamic aperture mask having a variable size aperture.

37. In a method of creating a three dimensional model of a three dimensional object having a plurality of elements using a light microscope having an objective aperture through which a light beam passes and a focal plane the steps comprising:

locating the microscope focal plane at various locations within the object;

for each location of the focal plane within the object:

cause the light beam that passes through the objective aperture to pass through only a portion of the objective aperture;

continuously change the portion of the objective aperture through which the light beam passes.

38. The method of claim 37 further comprising the steps of:

digitize the image of the object at each location;

eliminate from the digitized image all elements of the object that change location while the portion of the objective aperture through which the light beam passes is continuously changed thereby obtaining a focal plane specific image;

combine the focal plane specific images for each location of the focal plane within the object.

39. In a method of creating a three dimensional model of a three dimensional object using a light microscope having a focal plane the steps comprising:

viewing the object with the microscope focal plane at various locations within the object;

for each location of the focal plane within the object, causing the angle of view to continuously change.

40. The method of claim 39 wherein the object is composed of a plurality of elements and further comprising the steps of:

creating a digitized image of the object at each location of the focal plane;

eliminating from each digitized image those elements that change location with time to create a focal plane specific image.

41. The method of claim 40 further comprising the step of:

combining the focal plane specific images.

42. In an endoscopic device having an optical path for light that includes a probe and lens with an objective aperture for entering into a body to transmit a view of the interior thereof to a viewing system outside the body, the improvement comprising:

an objective aperture outside the body in the optical path between the lens and the viewing system; and

means continuously changing the portion of said objective aperture outside the body that passes light.

43. The improvement of claim 42 wherein said means is a dynamic aperture

mask disposed at said objective aperture.

44. The improvement of claim 43 wherein said dynamic aperture mask is an array of LCDs.

45 ~~46~~. The improvement of claim 43 wherein said dynamic aperture mask is an expandable bellows.

46 ~~47~~. The improvement of claim 43 wherein said dynamic aperture mask is overlapping leaflets.

47 ~~48~~. The improvement of claim 43 wherein said dynamic aperture mask is two overlapping semi-circular opaque discs.

48 ~~49~~. The improvement of claim 43 wherein said dynamic aperture mask is a plurality of sector-shaped LCDs.

49 ~~50~~. The improvement of claim 43 wherein said dynamic aperture mask has a variable size aperture.

50 ~~51~~. The improvement of claim ~~50~~ 49 wherein said variable size aperture is sector shaped.

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